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**Pillans et al.**

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(54) **ELECTRONIC MODULE WITH  
FREE-FORMED SELF-SUPPORTED  
VERTICAL INTERCONNECTS**

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(57) **ABSTRACT**

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USPC ..... 257/E21.499, E23.103, E23.181,  
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See application file for complete search history.

An electronic module, and method for making same,  
includes free-formed, self-supported interconnect pillars  
that electrically connect cover electronic components dis-  
posed on a cover substrate with base electronic components  
disposed on a base substrate. The free-formed, self-sup-  
ported interconnect pillars may extend vertically in a straight  
path between the cover electronic components and the base  
electronic components. The free-formed, self-supported  
interconnect pillars may be formed from an electrically  
conductive filament provided by an additive manufacturing  
process. By free-forming the self-supported interconnect  
pillars directly on the electronic components, the flexibility  
of electronic module design may be enhanced, while reduc-  
ing the complexity and cost to manufacture such electronic  
modules.

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**15 Claims, 4 Drawing Sheets**

